



Monitoring report form for CDM project activity
(Version 07.0)

MONITORING REPORT

Title of the project activity	Grid Connected Wind Energy Generation at Andhra Pradesh	
UNFCCC reference number of the project activity	5921	
Version number of the PDD applicable to this monitoring report	PDD Version 05 (Dated:12/03/2013)	
Version number of this monitoring report	01	
Completion date of this monitoring report	11/09/2020	
Monitoring period number	05	
Duration of this monitoring period	01/01/2018 – 30/06/2020 (Inclusive of both the dates)	
Monitoring report number for this monitoring period	01	
Project participants	Vish Wind Infrastrukture LLP (Private Entity) WeAct Pty Ltd. (Private Entity)	
Host Party	India	
Applied methodologies and standardized baselines	ACM0002: Consolidated baseline methodology for grid-connected electricity generation from renewable sources (Version 12.2.0, Annex 16, EB 65)	
Sectoral scopes	Sectoral Scope: 1 Energy industries (renewable/ non-renewable sources)	
Amount of GHG emission reductions or net anthropogenic GHG removals achieved by the project activity in this monitoring period	Amount achieved before 1 January 2013	Amount achieved from 1 January 2013
	0 tCO ₂ e	89,595 ¹ tCO ₂ e
Amount of GHG emission reductions or net anthropogenic GHG removals estimated ex ante for this monitoring period in the PDD	91,795 ² tCO ₂ e	

¹ Detailed Calculation has been given in ER sheet.

² Please refer section E.5 of the MR and ER sheet.

SECTION A. Description of project activity

A.1. General description of project activity

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The purpose of the project activity is to utilize wind energy potential for generation of electricity. The project activity replaces anthropogenic emissions of greenhouse gases (GHG's) into the atmosphere, which is estimated to be approximately 36,738 tCO_{2e} per year, by displacing an equivalent amount of electricity generation through the operation of existing fuel mix in the grid comprising mainly fossil fuel-based power plants and future capacity expansions connected to the grid.

M/s Vish Wind Infrastructure LLP (hereafter referred as "VWILLP") installed a 20.8 MW of capacity wind energy power plant in the state of Andhra Pradesh in India. The project activity involves supply, erection, commissioning and operation of 26 machines with rated capacity of 800 KW each. All the machines are E-53 make.

The first machine under the project activity was commissioned on 30/09/2011 and the last machine under the project activity was commissioned on 15/07/2012. The expected operational lifetime of the project is for 20 years.

The total emission reductions achieved under this monitoring period (01/01/2018 to 30/06/2020) is 89,595 tCO_{2e}.

Brief description of the installed technology and equipment:

The technical specifications of the Wind World WW-53 make WECs with rated capacity 800 KW are given below:

Main Specifications E-53	
Turbine model	Wind World WW-53
Rated power	800 KW
Rotor diameter	53 m
Hub height	75 m
Turbine Type	Gearless horizontal axis wind turbine with variable rotor speed
Power regulation	Independent electromechanical pitch system for each blade.
Cut in wind speed	2.5 m/s
Rated wind speed	12 m/s
Cut out Wind speed	28-34 m/s
Extreme Wind Speed	59.5 m/s
Rated rotational speed	32 rpm
Operating range rot. speed	12-29 rpm
Orientation	Upwind
No of Blades	3
Blade Material	Fibre Glass Epoxy reinforced with integral lightning protection
Gear box type	Gear less
Generator type	Synchronous generator
Braking	Aerodynamic
Output Voltage	400 V

Yaw System	Active yawing with 4 electric yaw drives with brake motor and friction bearing
Tower	74 m concrete

Relevant dates for the project activity:

The first machine under the project activity was commissioned on 30/09/2011 and last machine under the project activity was commissioned on 15/07/2012. The project activity consists of 26 machines (800 kW each) of Wind World make E-53, with a total capacity of 20.8 MW. The expected operational lifetime of the project is for 20 years. The details of issuance of CERs for the previous monitoring periods are as follows:

Monitoring Period No.	Monitoring Period	CER Issued
First Issuance	01 Apr 2012 - 31 Dec 2012 (Inclusive of both days)	18,532
Second Issuance	01 Jan 2013 - 31 Dec 2013 (Inclusive of both days)	40,401
Third Issuance	01 Jan 2014 - 05 Apr 2017 (Inclusive of both days)	1,09,059
Fourth Issuance (currently under verification)	06 April 2017 - 31 Dec 2017 (Inclusive of both days)	25,059

A.2. Location of project activity

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Host Party(ies); India

(b) Region/State/Province, etc.; Andhra Pradesh State

(c) City/Town/Community, etc.; Nallakonda & Thummalapenta villages in Kurnool and Anantapur district in Indian State of Andhra Pradesh.

(d) Physical/ Geographical location.

The detailed individual WECs location numbers and coordinates of project activity are provided in below:

1) Location details for Anantapur Site, Village – Nallakonda

Sl. no.	Commissioning date	Location no.	Latitude	Longitude
1.	15/07/2012	1	14° 03' 51.2"	77° 32' 06.9"
2.	15/07/2012	2	14° 03' 55.8"	77° 32' 03.4"
3.	15/07/2012	3	14° 03' 49.4"	77° 32' 29.6"
4.	15/07/2012	4	14° 03' 59.9"	77° 32' 26.1"
5.	15/07/2012	5	14° 04' 22.9"	77° 32' 22.1"
6.	15/07/2012	6	14° 04' 27.5"	77° 32' 17.4"
7.	15/07/2012	7	14° 04' 34.0"	77° 32' 12.3"
8.	15/07/2012	8	14° 04' 33.5"	77° 32' 00.5"
9.	15/07/2012	9	14° 04' 40.7"	77° 32' 15.2"
10.	15/07/2012	10	14° 04' 45.4"	77° 32' 12.6"
11.	15/07/2012	11	14° 04' 50.0"	77° 32' 10.5"
12.	15/07/2012	12	14° 04' 41.1"	77° 31' 44.2"
13.	15/07/2012	13	14° 04' 47.4"	77° 31' 44.5"
14.	15/07/2012	14	14° 04' 51.5"	77° 31' 44.0"
15.	15/07/2012	15	14° 04' 56.5"	77° 31' 41.9"
16.	15/07/2012	16	14° 05' 01.1"	77° 31' 40.8"
17.	09/07/2012	39	14° 08' 41.1"	77° 35' 29.0"
18.	09/07/2012	41	14° 08' 50.3"	77° 35' 01.0"

19.	09/07/2012	42	14° 08' 57.2"	77° 34' 53.4"
20.	09/07/2012	43	14° 09' 01.2"	77° 34' 50.5"
21.	09/07/2012	44	14° 09' 43.5"	77° 36' 02.6"
22.	09/07/2012	45	14° 09' 51.4"	77° 35' 57.9"
23.	09/07/2012	46	14° 09' 57.4"	77° 35' 50.2"
24.	09/07/2012	47	14° 10' 00.8"	77° 35' 48.5"

2) Location details for Kurnool Site, Village – Thummalapenta

Sl. no.	Commissioning date	Location no.	Latitude	Longitude
1.	30/09/2011	91	15° 02' 40.3"	78° 02' 54.0"
2.	30/09/2011	93	14° 03' 59.2"	78° 03' 04.9"

A.3. Parties and project participants

Parties involved	Project participants	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
Government of India (host)	Vish Wind Infrastructure LLP (Private entity)	No
Australia	WeAct Pty Ltd. (Private Entity)	No

A.4. References to applied methodologies and standardized baselines

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Title: “Consolidated baseline methodology for grid-connected electricity generation from renewable sources”

Reference: Approved consolidated baseline methodology ACM0002 (Version 12.2.0, Annex 16, EB 65) ACM0002 draws upon the following tools which have been used in the PDD:

- Tool to Calculate the Emission Factor for an Electricity System – Version 02.2.1, Annex 19, EB 63
- Tool for the Demonstration and Assessment of Additionality – Version 06.0.0, Annex 21, EB 65

Further information with regards to the methodology / tools can be obtained at

<http://cdm.unfccc.int/methodologies/DB/UB3431UT9I5KN2MUL2FGZXZ6CV71LT>

A.5. Crediting period type and duration

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Type : Fixed (10 Years)

Duration : 01/04/2012 to 31/03/2022

SECTION B. Implementation of project activity

B.1. Description of implemented project activity

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The first machine under the project activity was commissioned on 30/09/2011 and last machine under the project activity was commissioned on 15/07/2012. The project activity consists of 26 machines (800 kW each) of Wind World make E-53, with a total capacity of 20.8 MW. The commissioning date for all the machines included in the project activity is given in the section A.2.

There are no changes that have happened in project activity which may impact the applicability of the methodology. The operation and maintenance activities of Wind World are ISO certified and all the events are recorded in the log book available at the project site. Referring to the data available it can be inferred that there have not been any major special events for any of the machines that are included in the project activity. As a part of regular maintenance, the machines are stopped for mechanical and electrical maintenance for 16 to 18 hours annually and for visual inspection for 6 to 7 hours quarterly. During the monitoring period there were no events or situation occurred, which may impact the applicability of the methodology.

Description of maintenance intervals:

There is a pre-defined maintenance schedule for annual maintenance for all the WECs at project site. There are four types of maintenance activity have been executed for all the WECs. During maintenance, WEC needs to stop for defined time period which are as follows:

- 1) Visual maintenance : Average 3 to 4 hr stoppage of WEC
- 2) Grease maintenance : Average 3 to 4 hr stoppage of WEC
- 3) Electrical maintenance : Average 16 to 20 hr stoppage of WEC
- 4) Mechanical maintenance : Average 16 to 20 hr stop of WEC

Other than the above-mentioned maintenance activity, WEC were generating electricity continuously without any technical fault. Hence no break down has been noted during the monitoring period.

B.2. Post-registration changes

B.2.1. Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents

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There is no deviation from registered monitoring plan or applied methodology during this monitoring period.

B.2.2. Corrections

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There are no corrections from the registered PDD during this monitoring period.

B.2.3. Changes to the start date of the crediting period

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There are no changes to the start date of the crediting period.

B.2.4. Inclusion of monitoring plan

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Not Applicable.

B.2.5. Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents

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The monitoring plan has been revised and the calibration frequency has been changed to once in five years during the previous monitoring period. This is in line with para 5 (a) of the Appendix 1 of the CDM project standard and is beyond the control of the PP and does not have any impact on the emission reduction calculation. Hence, does not require any prior approval (approved on 07/06/2013; PRC-5921-001).

B.2.6. Changes to project design

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There are no permanent changes to project design of registered project activity.

B.2.7. Changes specific to afforestation or reforestation project activity

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The project activity is a wind power project; hence this section is not applicable.

SECTION C. Description of monitoring system

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Approved monitoring methodology ACM0002 (Version 12.2.0), Sectoral Scope: 1, “Consolidated monitoring methodology for zero-emissions grid-connected electricity generation from renewable sources”, is proposed to be used to monitor the emission reductions.

This approved monitoring methodology requires monitoring of the following:

- Electricity generation from the project activity; and
- Operating margin emission factor and build margin emission factor of the grid, where *ex-post* determination of grid emission factor has been chosen

Since the baseline methodology is based on ex-ante determination of the baseline, the monitoring of operating margin emission factor and build margin emission factor is not required.

Monitoring at Kurnool site:

The metering system for the project activity consists of cluster metering points at 33 kV at project site. Each cluster metering point has one main and one check meter (33 kV metering point).

All the WEGs of project activity will exclusively connected to individual cluster metering points i.e. there will be no WEGs of other project owners that are connected to these cluster metering points. In a particular wind-farm of Wind World, each cluster has WEGs of only one project owner.

In addition to the cluster metering point, there is one set of main & check meter (bulk/billing metering point) at 132 kV Ankireddypalli sub station, where all the WEGs of the project activity and non-project activity are connected.

Monitoring at Anantapur site:

The metering system for the project activity consists of cluster metering points at 33 kV at project site. Each cluster metering point has one main and one check meter (33 kV metering point). All the WEGs of project activity will exclusively connected to individual cluster metering points i.e. there will be no WEGs of other project owners that are connected to these cluster metering points. In a particular wind-farm of Wind World, each cluster has WEGs of only one project owner.

In addition to the cluster metering point, there is one set of main & check meter (bulk/billing metering point) at 220 kV Shapuram Sub-station, where all the WEGs of the project activity and non-project activity are connected.

Calculation of Net Electricity Supplied to the grid by project activity

Since the main and check meters (bulk meter) at 132 kV (for Kurnool) or 220 kV (for Anantpur) metering point is connected to the machines of the project activity and the machines commissioned by the other project developers, therefore in order to determine the net electricity supplied to the grid at 132 kV (for Kurnool) or 220 kV (for Anantpur), the state utility apply Line loss to the meter reading recorded at the 33 KV.

The summation of net electricity supplied to the grid from the two sites (Kurnool & Anantpur) under the project activity shall comprise the “Net Electricity Supplied to the Grid by the Project Activity ($EG_{PJ,y}$)”.

The total % of Line loss from WEGs (33 kV metering point) to 132 kV (for Kurnool) or 220 kV (for Anantpur) metering point is calculated by the state utility. Net Electricity supplied to the grid by project activity is calculated by applying Line loss to the meter readings taken at 33 kV metering point of the project activity.

The procedure for calculation of the percentage Line loss has been shown below:

$$T_E = \frac{(X_1+X_2+X_3+X_4+.....X_n) - Y}{(X_1+X_2+X_3+X_4+.....X_n)} \times 100\%$$

Where,

T_E = Percentage Line loss incurred in Line between the meters located at 33 kV metering point and the meters located at 132 kV (for Kurnool) or 220 kV (for Anantpur) metering point (bulk meter: main and check) at high voltage side of receiving sub-station.

$(X_1+X_2+X_3+X_4+.....X_n)$ = Summation of meter readings (Export) at 33 kV metering points for all the project developers connected to receiving substation (including the machines of the project activity and other project developers)

Y = Export Reading at bulk meter installed at high voltage side of transformer of the receiving substation at 132 kV (for Kurnool) or 220 kV (for Anantpur) metering point, connecting machines of the project activity and other project developers.

Monthly JMR recorded at 33 kV metering points as given by APCPDCL contains the following data:

1. Electricity Export (**EGJMR, Export,y**) : Electricity export to the grid at 33kV metering point.
2. Electricity Import (**EGJMR, Import,y**) : Electricity import from grid at 33kV metering point.

Net Electricity supplied to the Grid is calculated as:-

$$EG_{PJ,y} = EG_{Export,y} - EG_{Import,y}$$

Where,

$$EG_{Export,y} = EGJMR, Export,y \times (1 - TE) \dots\dots\dots(1)$$

$$EG_{Import,y} = EGJMR, Import,y \times (1 + TE) \dots\dots\dots(2)$$

The metering diagrams for both the sites (Kurnool & Anantpur) have been shown in Appendix I.

Metering Equipment:

All main and check meters are two-way tri-vector meters capable of recording import and export of electricity and under the control of state electricity utility.

All main and check meters are of 0.2s of accuracy class.

The details of the meters have been given below:

S.N.	Meter type	Make	Accuracy class	Meters	Main/ Check	Calibration Date	Calibration due Date
1.	Vish Wind Phase 1	L & T	0.2s	Main	12092978	22/09/2016	22/09/2021
				Check	12092998	22/09/2016	22/09/2021
2.	Vish Wind Phase 2	L & T	0.2s	Main	12092976	23/09/2016	23/09/2021
				Check	12092979	23/09/2016	23/09/2021
3.	Vish Wind Phase 4	Secure Premier	0.2s	Main	APW00074	22/02/2016	22/02/2021
				Check	APW00075	17/03/2016	17/03/2021

S.N.	Meter type	Make	Accuracy class	Meters	Main/ Check	Calibration Date	Calibration due Date
1.	220/33 kV Shapuram substation	L & T	0.2s	Main	12093025	23/12/2016	23/12/2021
				Check	12093032	23/12/2016	23/12/2021
2.	132/33 kV Ankireddipalli Substation	L & T	0.2s	Main	02798587	06/03/2015	06/03/2020
				Check	02798588	06/03/2015	06/03/2020

Meter Readings:

The meter readings are noted in the form of joint meter report and are signed jointly by the representatives of WWIL and the state utility. WWIL provides the report to the Project proponent and the project proponent maintains the report afterwards.

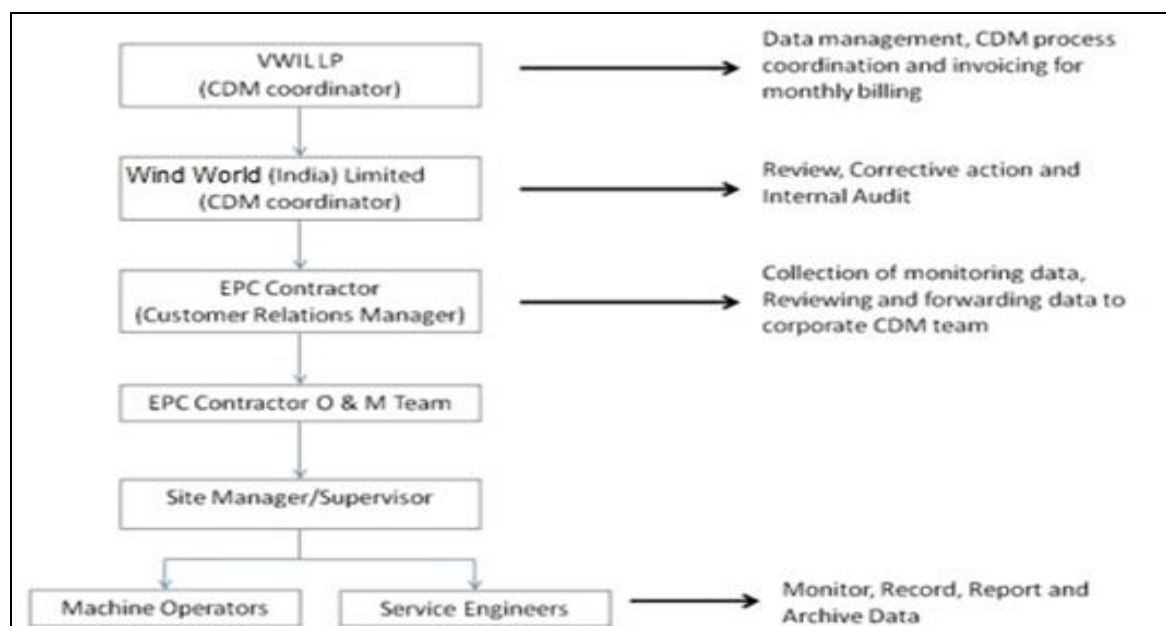
In case the main meter(s) is found to be operating outside the permissible limits, the main meter will be either replaced or calibrated immediately. Whenever a main meter goes defective, the consumption recorded by the Check meter will be referred.

QA/QC process:

All the meters are calibrated/ tested once in five years. The calibration is done by the officials of the state utility. The copy of the calibration/testing certificate is kept as record by the PP.

The Project is operated and maintained by WWIL. WWIL is an ISO 9001:2008 certified Quality Management system from Germanischer Lloyd. WWIL follows the documentation practices to ensure the reliability and availability of the data for all the activities as required from the identification of the site, wind resource assessment, logistics, finance, construction, commissioning and operation of the wind power project.

The operational and management structure implemented for data monitoring is as follows:



Training and maintenance:

In order to ensure that WWIL's staffs who are positioned to take care all the activities starting from project construction to operation and maintenance, WWIL Training Academy provides need based periodical training to meet the requirements of the project. The training is contemporary, which results in imparting focused knowledge leading to value addition to the attitude and skills of all the trainees. The training facility is located at Daman and is fully functional and equipped with qualified trainers, training equipment's, classrooms and hostel facilities.

SECTION D. Data and parameters

D.1. Data and parameters fixed ex ante

Data/Parameter	$EF_{grid,OM,y}$
Unit	tCO ₂ e/MWh
Description	Operating Margin Emission Factor of Southern Regional Electricity Grid
Source of data	<p>“CO₂ Baseline Database for Indian Power Sector”, version 6 published by the Central Electricity Authority, Ministry of Power, Government of India.</p> <p>The “CO₂ Baseline Database for Indian Power Sector” is available at www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm</p>
Value(s) applied	0.9684
Choice of data or measurement methods and procedures	Operating Margin Emission Factor has been calculated by the Central Electricity Authority using the simple OM approach in accordance with ACM0002.
Purpose of data/parameter	Baseline emission calculations
Additional comments	The value is calculated on ex-ante basis and it will remain same throughout the crediting period.

Data/Parameter	$EF_{grid,BM,y}$
Unit	tCO ₂ e/MWh
Description	Build Margin Emission Factor of Southern Regional Electricity Grid
Source of data	<p>“CO₂ Baseline Database for Indian Power Sector” version 6 published by the Central Electricity Authority, Ministry of Power, Government of India.</p> <p>The “CO₂ Baseline Database for Indian Power Sector” is available at www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm</p>
Value(s) applied	0.7634
Choice of data or measurement methods and procedures	Build Margin Emission Factor has been calculated by the Central Electricity Authority in accordance with ACM0002.
Purpose of data/parameter	Baseline emission calculations
Additional comments	The value is calculated on ex-ante basis and it will remain same throughout the crediting period.

Data/Parameter	$EF_{grid,CM,y}$		
Unit	tCO ₂ e/MWh		
Description	Combined Margin Emission Factor of Southern Regional Electricity Grid		
Source of data	<p>The “CO₂ Baseline Database for Indian Power Sector” version 6 published by the Central Electricity Authority, Ministry of Power, Government of India.</p> <p>The “CO₂ Baseline Database for Indian Power Sector” is available at www.cea.nic.in/reports/planning/cdm_co2/cdm_co2.htm</p>		
Value(s) applied	<p>In case of wind power projects default weights of 0.75 for $EF_{grid,OM}$ and 0.25 for $EF_{grid,BM}$ are applicable as per ACM0002.</p> <table border="1"> <tr> <td>Combined Margin Emission Factor (EF_y or EF_{CM,y})</td> <td>0.9172</td> </tr> </table>	Combined Margin Emission Factor (EF _y or EF _{CM,y})	0.9172
Combined Margin Emission Factor (EF _y or EF _{CM,y})	0.9172		
Choice of data or measurement methods and procedures	Combined Margin Emission Factor has been calculated by the Central Electricity Authority in accordance with CDM methodologies: ACM0002, and Tool to Calculate the emission Factor for an Electricity System.		

Purpose of data/parameter	Baseline emission calculations
Additional comments	The value is calculated on ex-ante basis and it will remain same throughout the crediting period.

D.2. Data and parameters monitored

Data/Parameter	EG_{PJ,y}
Unit	MWh (Mega-watt hour)
Description	Net electricity supplied to the grid by the Project activity
Measured/calculated/Default	Calculated
Source of data	Calculated
Value(s) of monitored parameter	97,683.166
Monitoring equipment	Not applicable
Measuring/reading/recording frequency	Monthly
Calculation method (if applicable)	<p>Metering system of the project activity consists of cluster metering points at 33 kV at project site (both at Kurnool & Anantpur). Each cluster metering point will have one main and one check meter (33 kV metering point).</p> <ul style="list-style-type: none"> In addition to cluster metering point there is one set of main & check meter (bulk/billing metering point), where all the WEGs of project activity and non-project activity are connected and billing is done. All main and check meters are two-way electronic tri-vector meters and under the control of state electricity utility. All main and check meters are of 0.2s of accuracy class. The procedures for metering and meter reading will be as per the provisions of the power purchase agreement except or otherwise explicitly stated in the PDD. Monthly Joint Meter Reading will be recorded by the State utility in the presence of PP's representative (Wind World). Net electricity supplied to the grid value is used in calculation of emission reduction of the project activity. <p>The calculation procedure has been explained in details in section C.</p>
QA/QC procedures	<p>All the main meter and check meters are calibrated by state utility once in 5 year.</p> <p>QA/QC procedures are as implemented by Discom/ State utility pursuant to the provisions of the power purchase agreement except or otherwise explicitly stated in the PDD.</p>
Purpose of data/parameter	Baseline Emissions calculations
Additional comments	The data has been archived both in electronic and hard paper format for crediting period + 2 years.

Data/Parameter	EG_{JMR Export,y}
Unit	MWh (Mega-Watt hour)
Description	Electricity export recorded at 33 kV (in the form of Joint meter reading report) cluster metering points connecting all WEGs of the project activity.
Measured/calculated/Default	Measured

Source of data	Electricity export to the grid as per the joint meter reading recorded at cluster metering point.
Value(s) of monitored parameter	98,739.09
Monitoring equipment	All meters of Phase 1 and 2 are of L&T make and Phase 4 meters are of Secure Primer; and all meters are of 0.2s of accuracy class. Details of Energy Meters & Calibration dates are given under Section C of this MR.
Measuring/reading/recording frequency	Measured continuously and recorded monthly
Calculation method (if applicable)	Electricity export to the grid will be recorded by cluster meters (main and check) connecting all turbines at 33 kV level.
QA/QC procedures	This value can be crosschecked from transmission loss calculation sheet provided by the state utility. All the main meter and check meters are calibrated by state utility once in five year. QA/QC procedures are as implemented by Discom/ State utility pursuant to the provisions of the power purchase agreement except or otherwise explicitly stated in the PDD.
Purpose of data/parameter	Baseline Emissions calculations
Additional comments	The data has been archived both in electronic and hard paper format for crediting period + 2 years.

Data/Parameter	EG_{JMR Import,y}
Unit	MWh (Mega-Watt hour)
Description	Electricity Import recorded at 33 kV (in the form of Joint meter reading report) cluster metering points connecting all WEGs of the project activity.
Measured/calculated/default	Measured
Source of data	Electricity Import to the grid as per the joint meter reading recorded at cluster metering point.
Value(s) of monitored parameter	67.94
Monitoring equipment	All meters of Phase 1 and 2 are of L&T make and Phase 4 meters are of Secure Primer; and all meters are of 0.2s of accuracy class. Details of Energy Meters & Calibration dates are given under Section C of this MR.
Measuring/reading/recording frequency	Measured continuously and recorded monthly
Calculation method (if applicable)	Electricity Import to the grid will be recorded by cluster meters (main and check) connecting all turbines at 33 kV level.
QA/QC procedures	This value can be crosschecked from transmission loss calculation sheet provided by the state utility. All the main meter and check meters are calibrated by state utility once in 5 year. QA/QC procedures are as implemented by Discom/ State utility pursuant to the provisions of the power purchase agreement except or otherwise explicitly stated in the PDD.
Purpose of data/parameter	Baseline Emissions calculations

Additional comments	The data has been archived both in electronic and hard paper format for crediting period + 2 years.
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Data/Parameter	EG _{Export,y}
Unit	MWh (Mega-Watt hour)
Description	Electricity exported by the project activity to the grid after apportioning of line losses between 33 kV metering point (Cluster meter) & Bulk metering point (132 kV metering point at Kurnool /220 kV metering point at Anantapur)
Measured/calculated/default	Calculated
Source of data	Certified "transmission loss calculation sheet" given by state utility/APCPDCL (Andhra Pradesh Central Power Distribution Company Limited).
Value(s) of monitored parameter	97,751.80
Monitoring equipment	All meters are of L&T make and 0.2s of accuracy class. Details of Energy Meters & Calibration dates are given under Section C of this MR.
Measuring/reading/recording frequency	Measured continuously and recorded monthly
Calculation method (if applicable)	Value is calculated by State Utility independently. Wind World or PP does not have any role or control on calculation of net electricity generation/export. The calculation procedure has been explained in details in section C.
QA/QC procedures	Value can be cross - checked from the invoices raised by PP to the DISCOM. All the main meter and check meters are calibrated by state utility. QA/QC procedures are as implemented by Discom/ State utility pursuant to the provisions of the power purchase agreement except or otherwise explicitly stated in the PDD.
Purpose of data/parameter	Baseline Emissions calculations
Additional comments	The data has been archived both in electronic and hard paper format for crediting period + 2 years.

Data/Parameter	EG _{Import,y}
Unit	MWh (Mega-Watt hour)
Description	Electricity Imported by the project activity to the grid after apportioning of line losses between 33 kV metering point (Cluster meter) & Bulk metering point (132 kV metering point at Kurnool /220 kV metering point at Anantapur)
Measured/calculated/default	Calculated
Source of data	Certified "transmission loss calculation sheet" given by state utility/APCPDCL (Andhra Pradesh Central Power Distribution Company Limited).
Value(s) of monitored parameter	68.64

Monitoring equipment	All meters are of L&T make and 0.2s of accuracy class. Meters details has been provided in section C of this MR.
Measuring/reading/recording frequency	Measured continuously and recorded monthly
Calculation method (if applicable)	Value is calculated by State Utility independently. Wind World or PP does not have any role or control on calculation of net electricity generation/Import. The calculation procedure has been explained in details in section C.
QA/QC procedures	Value can be cross - checked from the invoices raised by PP to the DISCOM. All the main meter and check meters are calibrated by state utility once in a year. QA/QC procedures are as implemented by Discom/ State utility pursuant to the provisions of the power purchase agreement except or otherwise explicitly stated in the PDD.
Purpose of data/parameter	Baseline Emissions calculations
Additional comments	The data has been archived both in electronic and hard paper format for crediting period + 2 years.

Data/Parameter	T_E
Unit	%
Description	Percentage Line loss between the 33 kV metering points (cluster meters including project activity and non - project activity) and the Bulk metering point (132 kV metering point at Kurnool /220 kV metering point at Anantapur)
Measured/calculated/default	Calculated
Source of data	Certified "transmission loss calculation sheet" given by state utility/APCPDCL (Andhra Pradesh Central Power Distribution Company Limited).
Value(s) of monitored parameter	Directly applied.
Monitoring equipment	Not Applicable
Measuring/reading/recording frequency	Monthly
Calculation method (if applicable)	The calculation procedure has been explained in details in section C.
QA/QC procedures	QA/QC procedures are as implemented by Discom/ State utility pursuant to the provisions of the power purchase agreement except or otherwise explicitly stated in the PDD.
Purpose of data/parameter	Baseline Emissions calculations
Additional comments	The data has been archived both in electronic and hard paper format for crediting period + 2 years.

D.3. Implementation of sampling plan

>>

As the parameter to be monitored does not require sampling approach for its determination this section is not applicable for the proposed project activity.

SECTION E. Calculation of emission reductions or net anthropogenic removals

E.1. Calculation of baseline emissions or baseline net removals

>>

Baseline emissions include only CO₂ emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity. The methodology assumes that all project electricity generation above baseline levels would have been generated by existing grid-connected power plants and the addition of new grid-connected power plants. The baseline emissions are to be calculated as follows:

$$BE_y = EG_{PJ,y} * EF_y$$

Where:

BE_y = Baseline emissions in year y (tCO₂/yr)

$EG_{PJ,y}$ = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh/yr)

$EF_{grid,CM,y}$ = Combined margin CO₂ emission factor for grid connected power generation in year y calculated using the latest version of the "Tool to calculate the emission factor for an electricity system" (tCO_{2e}/MWh)

Accordingly:

Baseline emissions calculation for the monitoring period is as follows:

$$\begin{aligned} BE_y &= 97,683.166 \text{ (MWh)} * 0.9172 \text{ (tCO}_{2e}\text{/MWh)} \\ &= 89,595 \text{ tCO}_{2e} \end{aligned}$$

The details of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity is provided in ER spreadsheet.

E.2. Calculation of project emissions or actual net removals

>>

The project activity uses wind power to generate electricity and hence, the emissions from the project activity have been taken as zero.

$$PE_y = 0$$

E.3. Calculation of leakage emissions

>>

No leakage has been considered from the project activity as per approved methodology ACM0002. Hence, $Ly = 0$

E.4. Calculation of emission reductions or net anthropogenic removals

	Baseline GHG emissions or baseline net GHG removals (t CO _{2e})	Project GHG emissions or actual net GHG removals (t CO _{2e})	Leakage GHG emissions (t CO _{2e})	GHG emission reductions or net anthropogenic GHG removals (t CO _{2e})		
				Before 01/01/2013	From 01/01/2013	Total amount
Total	89,595	0	0	0	89,595	89,595

E.5. Comparison of emission reductions or net anthropogenic removals achieved with estimates in the registered PDD

Amount achieved during this monitoring period (t CO _{2e})	Amount estimated ex ante for this monitoring period in the PDD (t CO _{2e})
89,595	91,795

E.5.1. Explanation of calculation of “amount estimated ex ante for this monitoring period in the PDD”

>>

As per registered CDM-PDD (PDD Version 05, Dated: 12/03/2013), the annual estimated volume of CERs is 36,738 tCO_{2e}. The total nos. of days included in this mentoring period (i.e. 01/01/2018 to 30/06/2020, inclusive of both the days) = 912. Thus, to calculate the ex-ante estimated value of ER corresponding to this monitoring period, the annual estimated ER value (as per registered PDD) has been extrapolated for the equivalent period, i.e. 912 days, which results in 91,795 tCO_{2e}. Whereas actual ER achieved is 89,595 tCO_{2e}. The detailed calculation has been provided in ER calculation sheet.

E.6. Remarks on increase in achieved emission reductions

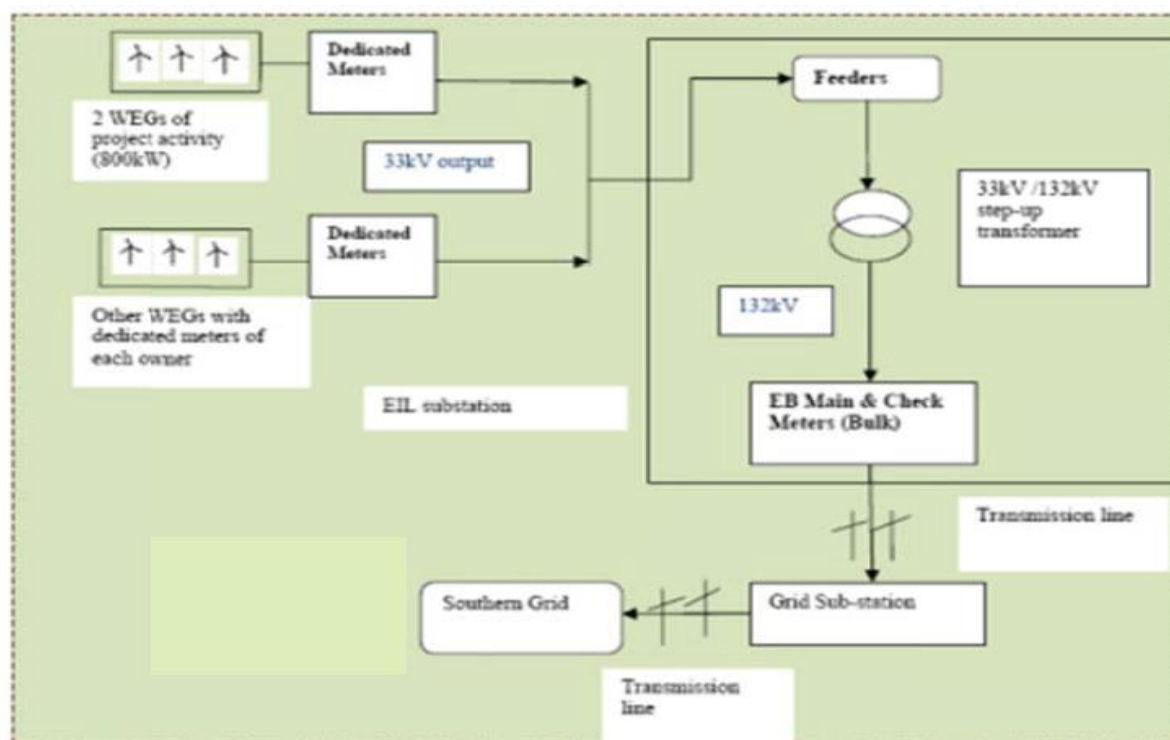
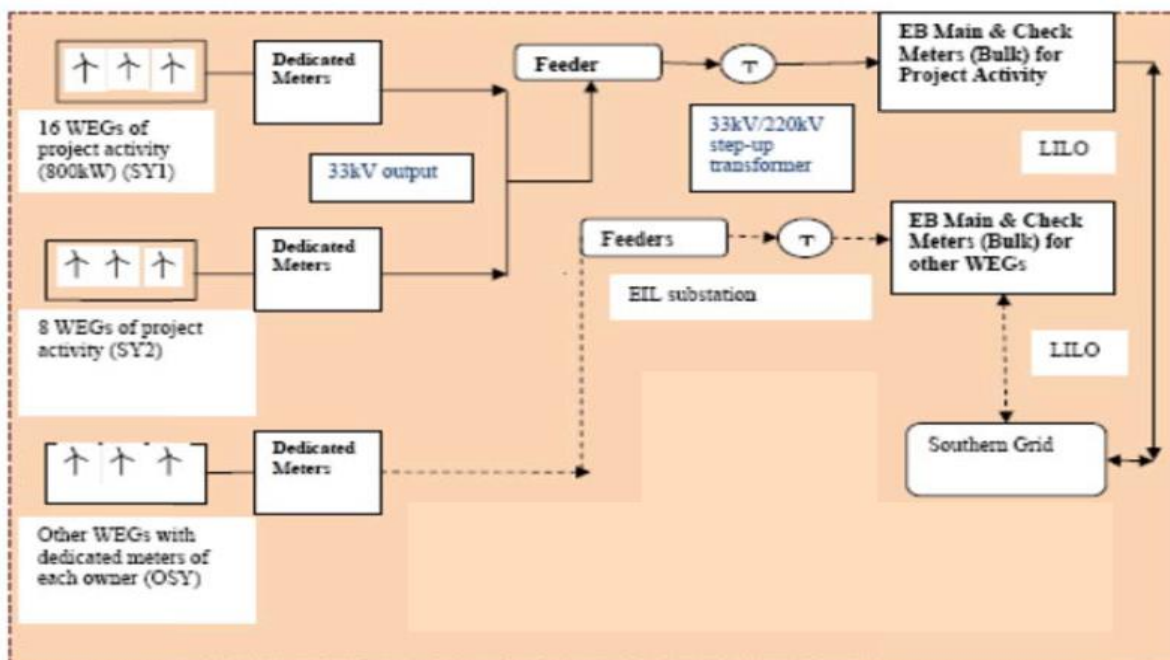
>>

There is a difference of 2.40 % (downside) in the expected and actual emission reductions due to lower PLF achieved during the monitoring period under consideration.

E.7. Remarks on scale of small-scale project activity

>>

The project is a large-scale project activity.

Annex 1Kurnnool site:Anaantapur site:

SY1 – Switch yard 1

SY2 – Switch yard 2

OSY – Switch yard for other WEGs outside CDM project activity

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Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
07.0	31 May 2019	Revision to: <ul style="list-style-type: none"> • Ensure consistency with version 02.0 of the “CDM project standard for project activities” (CDM-EB93-A04-STAN); • Add a section on remarks on the observance of the scale limit of small-scale project activity during the crediting period; • Add "changes specific to afforestation or reforestation project activity" as a possible post-registration changes; • Clarify the reporting of net anthropogenic GHG removals for A/R project activities between two commitment periods; • Make editorial improvements.
06.0	7 June 2017	Revision to: <ul style="list-style-type: none"> • Ensure consistency with version 01.0 of the “CDM project standard for project activities” (CDM-EB93-A04-STAN); • Make editorial improvements.
05.1	4 May 2015	Editorial revision to correct version numbering.
05.0	1 April 2015	Revisions to: <ul style="list-style-type: none"> • Include provisions related to delayed submission of a monitoring plan; • Provisions related to the Host Party; • Remove reference to programme of activities; • Overall editorial improvement.
04.0	25 June 2014	Revisions to: <ul style="list-style-type: none"> • Include the Attachment: Instructions for filling out the monitoring report form (these instructions supersede the "Guideline: Completing the monitoring report form" (Version 04.0)); • Include provisions related to standardized baselines; • Add contact information on a responsible person(s)/ entity(ies) for completing the CDM-MR-FORM in A.6 and Appendix 1; • Change the reference number from <i>F-CDM-MR</i> to <i>CDM-MR-FORM</i>; • Editorial improvement.
03.2	5 November 2013	Editorial revision to correct table in page 1.
03.1	2 January 2013	Editorial revision to correct table in section E.5.
03.0	3 December 2012	Revision required to introduce a provision on reporting actual emission reductions or net GHG removals by sinks for the period up to 31 December 2012 and the period from 1 January 2013 onwards (EB 70, Annex 11).
02.0	13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the monitoring report form" (EB 66, Annex 20).
01.0	28 May 2010	EB 54, Annex 34. Initial adoption.

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